

LABORATORY

OF THE

INLAND REVENUE DEPARTMENT

OTTAWA, CANADA

BULLETIN No. 390

FLAVOURING SYRUPS, Etc.

NOTE 8.-FEED FLOUR.

Shorts (middlings) are legally defined as feeds having a minimum protein content of 15 per cent, a minimum fat content of 4 per cent, and a maximum fibre content of 8 per cent.

An article frequently sold as special shorts, or choice shorts, and usually commanding a higher price than legal shorts, on account of its lighter colour, and its flour-like appearance, usually fails to meet the above standard; and when sold as shorts may be judged as adulterated under the Act. (See Bulletin No. 350.)

The article referred to is deficient in fat. Of 125 samples reported in Bulletin No. 350, seventy samples contained less than 3 per cent of fat, while shorts is required to contain at least 4 per cent. It is also, as a rule, low in protein. Of the 125 samples just referred to, forty-two samples contained less than 15 per cent of protein. On the other hand, the fibre content of this article is generally much below the limit of 8 per cent allowed in shorts.

The only legal way of marketing this feed is to register it, and to furnish a guarantee as described in the Feeds Act. It should not be offered as shorts or middlings, but as feed flour.

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FLAVOURING SYRUPS, Etc.

December 19, 1917.

J. U. VINCENT, Esq., K.C., B.A., L.Ph., Deputy Minister of Inland Revenue.

Sir.—I would respectfully call your attention to the fact that, during recent years, this department has frequently been asked to look into the matter of fruit syrups and kindred preparations as supplied to the trade for use in soda fountain beverages. We have been prevented for the subject earlier by press of other work; but in June of this year control of 141 samples to be made in the cities and principal towns of the control of the second over, with results as inclosed. The inventor was placed in charge of Mr. Geo. H. Brother of this staff, and his report is herewith submitted.

An Order in Council of February, 1911 (published as Circular G. 947) defines fresh fruit juices and sweet fruit juices; but only in very general terms, and without special regard to the employment of these articles for soda fountain use. The beverages offered at these fountains are not usually claimed to be fruit juices, but are essentially grated water (soda water) flavoured with a fruit juice, which may be actually such, or may be a synthetic preparation imitating the fruit which gives its name to the drink. In the latter ease, the satisfactory character of the preparation, so far as flavour is concerned, will depend upon the skill of the manufacturer; and provided that the ingredients are harmless, and that the article is properly described as an imitation, and not as a true fruit juice, there is no ground for complaint. The employment of preservatives and dyes, under the conditions of G. 1111 and G. 1167 is permitted.

These soda fountain syrups are now so largely used that it is desirable to define them more closely than at present is the case under G. 947; and it was mainly with a view to obtaining information regarding them that the work herein reported was undertaken.

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Three of the samples, sold as orange flavouring syrups, contain no sugar; and are not syrups, two being concentrated fruit juices, preserved with salicyclic acid and formaldehyde, and one a synthetic preparation. The remainder are true syrups (containing sugar) and the results of their examination are summarized as follows:-

	1											
		F	lavour.			Dyes.		Preservatives.				
Name.	Total samples	Natural.	Synthetic.	Doubtful.	None.	Certified.	Uncertified.	None.	Ben. seid.	Sal. acid.	Formal- dehyde.	Alcohol.
1) Strawberry 2) Pineapple Cherry. Lemon. Orange Raspberry Vanilla Chocolate Peach Coffee Ginger, Saraaparilla Rose, Fig 3) Claret. Grape (4) Rainbow. Apricot Banana	27 22 21 18 15 11 7 6 3 1 1 1 1 1 1 1	23 21 20 7 6 6 6 3 1 1 0 0 0 1 1 0	2 1 0 8 6 0 1 0 0 0 0 1 1 0 0 0 0 1 0 0 0 1	2 0 1 3 3 4 0 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0	9 21 2 4 3 1 7 6 3 1 1 1 0 0 0 1 1	12 1 13 19 2 9 0 0 0 0 0 0 0 0 0	6 1 6 4 10 1 0 0 0 0 0 0 1 1 0 0 0 0 0 0 0 0	8 10 7 12 5 6 0 1 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	14 6 1 3 6 0 2 0 0 0 0 1 0 1 1 1 2 0 0 1 1 1 1 1 1	2 2 7 1 5 1 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0	2 2 1 1 1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0	111000000000000000000000000000000000000
	141	104	22	15	62	49	31	58	47	22	12	

(1) Alcohol 19:18 p c. volume.

" 35.21 Contains n i al ohol.

(4) Mixture cherries and pineapple.

The information furnished herewith will assist your Advisory Board in defining soda fountain syrups; and I would respectfully recommend publication of this report as Bulletin No. 390.

I have the honour to be, sir,

Your obedient servant,

A. McGILL, Chief Analyst. Dr. A. McGnl., Chief Analyst.

DEAR SIR,—I beg leave to submit the following report on the examination of 141 samples of fruit juices or syrups for soda fountains as used throughout the Dominion.

There is no specific definition for this class of products given in the Adulteration Act, though in G. 947 (February 11, 1911), are the following:—

- 1. Fresh Fruit Juices.—1. "Fresh fruit juices are the clean, unfermented liquid products obtained by the first pressing of fresh, ripe fruit, and correspond in name to the fruits from which they are obtained, and contain not more than two (2) per cent of alcohol by volume."
- 4. Sweet Fruit Juices, Sweetened Fruit Juices, Fruit Syrups.—1. "Sweet fruit juices, sweetened fruit juices, fruit syrups, are the products obtained by adding sugar (sucrose) to fresh fruit juices, and correspond in name to the fruits from which they are derived."

It is worthy of note that in neither of the above definitions is there any mention of synthetic fruit syrups, i.e., syrups made from synthetically prepared esters and acids imitating those found in the natural fruit, nor of the addition of preservatives and artificial colouring matter.

Since, as I have stated above, there are no specific standards set for fruit syrups intended for fountain use, it is important that deviations from the existing standards be examined to determine whether or not they should be classed as adulterations. Of course syrups containing substances harmful to health will not be considered under this head: there is absolutely no doubt or question as to their adulteration, on other grounds than that they are a menace to the health of the public.

Synthetic Fruit Syrups.—The use of synthetic, or manufactured preparations for flavouring purposes, such as methyl salicylate for oil of wintergreen, vanillin or commarin for vanilla extract, ethyl butyrate for pineapple, etc., is quite common. They are cheaper and easier to prepare than the natural extracts, hence bring the manufacturer larger profits if they can be sold at approximately the same price charged for extracts. These preparations are inferior to the natural extracts, since the latter owe their delicate flavour to resins and traces of other esters besides the principal one; the former are practically nothing but an alcoholic solution of the principal ester. The result is that, while the preparation may be stronger (in the sense that less is required to produce the flavour), the natural extract is the more pleasing to the taste. To protect the public and yet permit the sale of synthetic preparations, an Order in Council (G. 1276, April 7, 1917) requires the synthetic preparations to be labeled "Imitation" or "Artificial" in letters as large as the rest of the label.

The problem of protection is somewhat different in the present case, since the public purchases fountain flavours only in mixtures. It is, of course, possible and desirable that manufacturers of syrups be required to conform to a regulation similar to that cited above, but this would protect the vendors only. In order to protect the general public, I would recommend a requirement that fountain drinks or preparations flavoured with synthetic flavours be sold over the counter as "mock" strawberry, "mock" pineapple, etc., as the case may be, and that they be so listed or described on the printed menus.

Preservatives.—There is no strong objection to the use of the permitted preservatives (G. 1111, April 15, 1914) in this class of fruit syrups. The syrup is so diluted

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when sold to the consumer that none of the listed preservatives would be harmful, even though present in somewhat larger quantities than permitted. It is true there remains the question as to whether any other preservative than the sugar is necessary. Barnard (Chem. Abst. 3 (1909), 2475), claims that fruits preserved in 10 pounds sucrose per gallon of water keep at least seven days, exposed to room temperature during the day and placed in a refrigerator at night; if preserved in 14 pounds sucrose, a syrups results "sufficiently heavy for all practical purposes" which keeps under any ordinary conditions. As no work along these lines has been done in this laboratory up to the present time, we are unable to comment on Barnard's work. As stated above, however, there is no reason why permitted preservatives in reasonable amounts should not be used, provided they are declared by the manufacturer of the label.

Artificial Colouring.—Freshly prepared fruit syrups are beautifully coloured, due to the natural pigments present in the fruit. Exposure to light causes most of these colours to fade, often to a very unpleasing shade. The fruit itself is not affected, but its appearance renders it unattractive. This would unjustly and seriously affect the business of the dispenser, were it not possible to reproduce nature's colours by the addition of small amounts of harmless dyes. The Department has, therefore, certified in G. 1167, January 18, 1915, seven analine dyes for use in colouring of foods, as follows: Amaranth 107, Ponceau 3R 56, Erythrosin 517, Orange 1-85, Napthol Yellow S4, Light Green ST435, Indigo Carmine 692, and in G. 1278, April 21, 1917, Tartrazine 94. The numbers refer to the classification by Schulz and Julius, as edited by Arthur G. Green.

Among these eight certified colours are found the three primary colours (red, blue and yellow) as well as the complementaries, orange and green. They are sufficient, therefore, to satisfy every demand, since combining two or more of them practically any colour or shade may be produced. The United States has but five certified colours: Amaranth 107, Ponceau 3R 56, Orange 1-85, Tartrazine 94, and Indigo Carmine 692. The National Aniline and Chemical Company, Inc., of New York, has combined these so as to produce fifteen shades and colours besides the original certified five, which they sell under such trade names as "Strawberry Red," "Deep Chocolate," "Yellow Colour, Egg Shade," etc. They have kindly furnished us with samples of all their certified colours for food products and confectionery. Investigation of these samples has demonstrated the fact that manufacturers of fruit syrups have here every colour and shade of the natural fruit, so have no excuse for the use of any but certified colours. As will be shown later, the majority of samples of fruit syrups examined were found coloured with certified dyes, a fact much to the credit of the manufacturers as this is the first examination of this class of fruit syrups, as well as the first investigation of dyes used to colour food products in this laboratory.

The method used for the detection and identification of the dye is outlined in the Journal of the Association of Official Agricultural Chemists (J.A.O.A.C, 2, 161). A piece of white woollen yarn is boiled for about fifteen minutes in the solution to be tested, to which a few drops of hydrochloric acid have been added. It is then removed, washed well with water and dried. If an aniline dye is present in the solution, the wool will be fast dyed. When dry it is cut into four pieces, which are treated with concentrated hydrochloric and sulphuric acids, and dilute solutions of sodium and ammonium hydroxides. The colour reactions are noted and by means of a table of these reactions the dye is identified. This identification can be regarded as only approximate, as the method is rather crude, some of the reactions as given in the table being questionable. For example Amaranth 107, according to the table, gives reactions which we could not duplicate with samples of the pure dye. To show these discrepancies, we will copy the reactions as given in the table and under them give those we obtained with two separate samples of the pure dye:—

	Hydroehlorie.	Sulphurie.	Sod. Hydrox.	Ammonia.	
Given	Slightly darker.	Violet to brownish.	Dull brownish.	Little change.	
	Deep red.	Violet,	Red.	Red.	

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There is no doubt about the violet colour with sulphuric acid, as the table would lead one to believe; not only did the two samples of pure Amaranth 107 give a very decided violet colour but also five red compound colour (strawberry red, etc.) showing Amaranth to be the base dye used in their construction.

Several syrups contained dyes we were unable to identify; these we classed as "artificial" dyes and considered them uncertified. The subject of dyes and their identification is being further investigated and we hope soon to get out our own table of colour reactions and a more rigorous method than that described above. We are much indebted to Mr. W. H. Watkins, chief chemist of the Buffalo factory of the National Aniline and Chemical Company, Inc., for assistance on this subject.

In order to facilitate comparison, tables have been prepared in which the data on all samples of the same flavour is listed. This also permits more extended remarks and criticism than would be possible were the data given in one large table.

STRAWBERRY (27 SAMPLES.)

Sample No.	Analyzed at.	Dye.	Preservative.		Sucrose	Analyst's Description	
	Zimiyaou ac.		Substance.	р. с.	р. с.		
76602	Halifax	Amaranth 107	one			Gezuine syrup.	
76605	11	Ponceau 3R 56	8			Doubtful syrup.	
78045	11	None				Genuine syrup,	
78046						Genuine fruit.	
71216		Amaranth 107				Genuine syrup.	
65261	Ottawa	None	Benzoic acid	0.0619		Genuine fruit.	
65264	17			0.1132	7 02	Genuine fruit.	
65269		Amaranth 107		0.2167	26.06	Genuine syrup.	
72591		None	None		29:44	Genuine syrup.	
77515		Artificial	Alcohol	19.18	2.26	Synthetic syrup.	
77534		Ponceau 6R 108	None		27:15	Genuine syrup.	
77864		Amaranth 107	Benzoic acid	0.0980		Genuine fruit.	
77866		None	11	0.1342		Genuine syrup.	
77965	11		Salie. acid	Trace.		Genuine fruit.	
77966		Ponceau 3R 56	Benz, acid	0.0929	22.56	Genuine syrup.	
77970		Amaranth 107	Formalin	0.0174	0.00	Synthetic syrup.	
77971		None	Benz. acid	Trace.	87:14	Genuine fruit.	
77972			Formalin	0.0024		Genuine fruit.	
74084	H Peres	Artificial	Salic. acid	0.0168		Genuine fruit.	
75328	Winnipeg	Palatine Red 62	Benz. acid	Trace.	33 12	Genuine syrup.	
52696		Amaranth 107	11	**		Genuine syrup.	
52701		. 107	None			Genuine syrup.	
68123	Vancouver	Ponceau 3R 56	Benz. acid	0.057	11.31	Genuine syrup.	
75923	81	Erythiosin 517	16	0.001	59.50	Doubtful syrup.	
75930	17	Ponceau 3R 56		0.144		Genuine fruit.	
75863		Crystal Ponc. 64		0.0932		Genuine syrup.	
75867	н	Palatine Red 62		0.0568	37 40	Genuine fruit.	

In the 27 samples of strawberry flavour examined, 2 were found to be synthetic preparations, 2 doubtful, and 23 genuine, 8 samples contained no preservative, 14 small amounts of soda benzoate, 2 salicylic acid, 2 formaldehyde and 1 alcohol. Of the 18 samples which were artificially coloured, but six contained an uncertified dye.

PINEAPPLE (22 samples.)

Sample		Down	Preservative.		Sucrose	Analyst's Description.	
No.	Analyzed at.	Dye	Substance.	р. с.	р. с.	Analyst's Description.	
76606	Halifax	None	None			Genuine syrup.	
76610			11			" "	
78043		**				" fruit.	
78050				Trace		" ayrup.	
71219			None			11 11	
7488	Ottawa				42.26	11 11	
65263	H		Formalin	0.0171	18:35	11 11	
65270			None		14.19		
72593			Formalin	0.0876		11 11	
77512	11		Benz. acid	0 0929	50 14	11 11	
77514		Artificial	Alcohol	35.51	15.34	Synth. "	
77865		None	Salic. acid	0.0544	56.46	Genuine fruit.	
77869		11	Benz. "	0.1548	57 18	" syrup.	
77967	11	"	None		19.86	" fruit.	
75325	Winnipeg	4			36 16	" syrup.	
52697	"				17 32	" "	
68420	Vancouver		Benz. acid	0 045	48 29	11 01	
68443	"		U U	0.009	46.80		
73922			1 11 11	0.020	60 85	11 11	
75931			1 11 12	0.101	39 37	" fruit.	
75864		11	11 11	0.1084		" syrup.	
75868	9		None	0 2001	1.28	" fruit.	

There was but one synthetic syrup in the twenty-two samples of pineapple flavour examined. This preparation was the only artificially coloured sample. Ten samples contained no preservative other than sucrose, seven contained benzoate of soda, two salicylic acid, two formaldehyde and one alcohol.

CHERRY (21 samples.)

Sample	Analyzed at.	Dye.	Preservativ	e.	Sucrose	Analyst's Description		
No.		2,	Substance.	р. с.	р. с.		.,	
71220		Porceau 3R 56 Amaranth 107	None				yrup. t. syrup.	
72597	"	11 11		0.006	11 16	m.	**	
72599				0.004	47 79	"		
77513		None	11 11	0.016	22.15		fruit.	
77517		Palatine Red 62	None		17 95		syrup.	
77533		Ponceau 3R 56	Formalin*	0.003	1.40		fruit.	
77572	11		Salic. acid		15 22	"	" (mint).	
77867		Palatine Red 62	None		4.75	11	fruit.	
77964		Artificial	Salic. acid	0.012	39 66	"	11	
74085	н	Magenta 448			32.91	- 0	н	
75327	Winnipeg	Palatine Red 62		Trace.	22 49	11	syrup.	
79508	19	Cryst. Ponceau 64			66 30	11	11	
52731		Amaranth 107			51.70	11	H	
68418	Vancouver	Ponc. 3R 56		0.054	6.54	111	#	
68441	H	Amaranth 107		0.094	16 69	"	11	
75925			11 11	0.01	46:36	19	11	
75928		Ponc. 3R 56		0.076	3.47	11	fruit.	
75869		None			1.28		99	
75871	H		Benz. acid		8:36	11	H	

^{*} Benzoate declared.

Of the twenty-one samples examined, one was doubtful, the remaining twenty genuine. All were found to be coloured but two, thirteen with certified dyes and six with others. Seven contained no other preservative than sucrose, six sodium benzoate, seven salicylic acid and one formaldehyde.

Six samples (Nos. 77513, 77533, 77867, 77964, 75928 and 75871) were labeled and sold as "Maraschino cherries." Steps should be taken to require manufacturers of this class of goods to label their product in a less deceiving manner, since these were not maraschino cherries. The following extract from Food Inspection Decisions, United States Department of Agriculture, F.I.D. 139 (Chem. Abst. 6, (1912), 1473) first defines the term, then places regulations on the labeling of products similar to the above: "Maraschino is a liqueur or cordial prepared by fermentation and distillation from a small wild Dalmatian cherry. Imitations of maraschino should be labelled "imitation." Cherries of other varieties preserved in maraschino liqueur may be called "cherries in maraschino," or if preserved in a syrup flavoured with maraschino alone, may be called "cherries, maraschino flavour" or "maraschino flavoured cherries." Sample No. 75869, put out by the Liquid Carbonic Company of Chicago, conforms to the above: it is labeled "cherries, imitation maraschino flavour."

LEMON (18 samples.)

mple	Analysed at.	Dye.	Preservativ	8	Sucrose			
No.	Analysed at.	Dye.	Substance.	p. c.	р. с.	Analyst's Description		
78042 78048 71215 71217 71221 71222 5652 7486 65265 72596 72600 77851 74081 52693	Ottawa.	Tartrazine 94. None. Partrazine 94. Orange 1 85. Tartrazine 94. Artificial Napth. Yel. S 4 None. Auramine 425. Tartrazine 94. Quin. Yel. 667 None. None,	Salic. acid None Salic. acid None Formalin None Salic. acid* None	0.023 0.031 0.022	54 54 39 49 63 92 32 62 57 36 2 09 44 18	Synthetic syrup. Genuine syrup. Synthetic syrup. """ Genuine syrup. """ Synthetic syrup. Genuine syrup. Genuine syrup. Doubtful syrup.		
68442 75862	11	"	None		55·76 47·07	Synthetic syrup.		

^{*} Benzoate declared.

Genuine flavours, 7; synthetic, 8; doubtful, 3. The dyes show a better proportion, only four samples being coloured with uncertified dyes. Twelve samples were found to be preserved with sucrose alone, four with salicylic acid and one each with sodium benzoate and formaldehyde. The explanation for the large percentage of synthetic preparations of this flavour is probably found in the fact that of all flavours, lemon and orange are the easiest and probably the most commonly reproduced. It is well known that the so-called "circus lemonade" is nothing but a water solution of citric or tartaric acid, sweetened and coloured.

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ORANGE (45 samples).

Sample			Preservative.		Sucrose,	Analyst's description.
No.	Analyzed at	Dye.	Substance.	p.c.	p.c.	Analyses description.
76608 78041 71218 5653 7485	Ottawa	ArtificialOrange 1 85Meth. Orange 1 85	None	e·023 0·014 0·015 0 057	33 06 52 72	Genuine syrup.
65260 77516 77868 78612 75326 79506	Winnipeg	Orange G 14 Croceine Or. 13 Orange IV 88 None Orange 11 86	Benz. acid	0 020 0 170 0 013 Trace.	00:00 2:61 00:00 00:00 30:39	Syn. syrup.
5269 5 52699 68417 75926	Vancouver	Orange 11 86.,	None Benz. acid.	0.01	59·40 60·24	11

Six genuine, three compound, three synthetic and three doubtful. Ten samples were found coloured with forbidden dyes. This must be due to ignorance since no samples were more brilliant in colour than those dyed with orange 185. Five samples contained no added preservative (one, No. 75326, not even sucrose), three salicylic acid; five benzoic acid; two formaldehyde.

RASPBERRY (11 samples.)

Sample	Analyzed at	Dye.	Preservative.		Sucrose.	Analyst's description.	
No.	24 (lasty zed at	17y0.	Substance.	p.c.	p.c.		
78049 71223 72594 77535 77969 74082 75330 52702 64421 75866 75924	Ottawa	None	None Formalin. Benz. acid Salic. acid None Benz. acid None Benz. acid	0°266 0°017	11 36 1 23 37 14 55 76 21 57 38 59 1 30 13 73	Doubt. syrup. Gen. syrup. Doubt. syrup.	

Out of eleven samples examined, seven were found to be genuine and four doubtful. Only one sample was coloured with an uncertified dye. Three samples contained no preservative, six benzoic acid, one salicylic acid and one formaldehyde.

VANILLA (7 samples).

Analyzed at.	Dye.	Preservative.	Sucrose.	Analyst's description.		
		Substance. p.	c. n. c.			
Halifax	None	None		Gen. syrup.		
Ottawa				Syn. "		
	11	Salic. acid 0				
Winnipeg	/n	**	56 82	19 88		
	Halifax Ottawa Vinnipeg	Halifax. None	Analyzed at. Dye. Substance. p.	Analyzed at. Dye. Substance. p. c. n. c. Halifax. None. None Ottawa Substance. p. c. n. c. Formalin. 0 018 36 59 37 08		

There was but one synthetic preparation (flavoured with coumarin) in the seven samples examined. Aniline dyes were found in none, though No. 75334 was coloured with caramel. Two contained small amounts of foreign preservatives, salicylic acid and formaldehyde.

CHOCOLATE (6 samples).

Sample No.	Analyzed at.	Dye.	Preservative	Sucrose.	Analyst's description.		
			Substance.	р. с.	р. с.		
	Halifax Ottawa		None		48 66	Gen. sj	•
72595 72598	16				29 82 43 98	98	17
	Winnipeg	11	11		61 60	89	19

No comment is necessary on the above; it speaks for itself.

PEACH (3 samples).

Sample	Analyzed at.	Dye.	Preservative	9.	Sucross.	Analyst's description.	
			Substance.	p. c.	p. c.		
65262 778 71 758 7 0	Ottawa Vancouver	None	FormalinBenz. acid	0·050 0·059 Trace.	44·17 17-31 31·58	Gen. ayrup.	

All genuine, none dyed. Two were preserved with sodium benzoate and one with formaldehyde.

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MISCELLANEOUS (11 samples).

Sample.	Analyzed at.	Flavour.	Dye,	Preserva	tive.	Sucrose.	Analyst's description.
No.				Substance.	p. c.	p. c.	
76609	Halifax	Ginger	None.	Salie acid	Trace.		Gen. syrup.
71224 652 5 9	Ottowa	Rose	Aniline Yel. 7	Formalin			Syn. "
77870	#	Fig	None.	Benz. acid	0.110	43.08	Gen. fruit.
77872		Claret	Artificial	Salic. "	0.019		Doubt. syrup.
77983	11		Indigotine P. 693		0.075		Syn. "
75865			Erythrosin 517				Gen. fruit.
75929	11	Apricot	None.	11 11		29.88	n h
68422			Ponceau 3R 56	11 11	0.110	42.60	Syn. syrup.
75927		10	None	11 11	Trace.	56.26	H II

Six genuine, four synthetic and two doubtful. Three samples were coloured with uncertified dyes. Six were found to contain sodium benzoate, two salicylic acid, and one formaldehyde.

In the collection were found three extracts (7451, lemon; 7495, vanilla; 7450, pineapple) and a soft drink (No. 75331, loganberry) collected by mistake.

Summary.—In the total number of syrups examined (141), one hundred and four were found to be genuine, twenty-two synthetic and fifteen doubtful. There were only thirty-one samples coloured with uncertified dyes. Fifty-eight samples contained no added preservative, forty-seven benzoic acid or benzoates; twenty-tw salicylic acid; twelve formaldehyde and two alcohol. Such low percentage of synthetic preparations and syrups coloured with uncertified dyes in this representative collection, indicates that it will be a comparatively easy matter to enforce the standards as recommended in the first part of this report.

GEO. H. BROTHER,

Assistant Analyst.

BULLETIN NO. 390-FRUIT FLAVOURS.

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	Inspector's Report. (Is	not an expression of opinion.)
	of Manufacturer given by the or.	Furnisher.
	Name and Address or Furnisher as	Manufacturer.
	Cost.	Quantity.
	W. was not by Advances of	Vendor.
		No. of Sau
The state of the s	Nature	of Sample.
	Mection.	Date of Co

DISTRICT OF NOVA SCOTIA-R. J. WAUGH, INSPECTOR.

	Lemon.	Strawberry.	Chucolate.	Coffee.	Strawberry.	Fineapple,	Vanilla.	Crange.	Ginger.	Fineapple.
					5J. H. Smith, Toronto Nat. Drug Co., Halifax.	TR.				
_	Co., Toronto. Mf		Isliex u		Toronto. Na	Boston, Mass Mi			J. J. McLaughlin, Toronto. Mfra	
	25 Imperial Ext.				.5J. H. Smith,	25 Murray Co.,	38 Vendors	200	38.1. J. McLauk	40 J. H. Smith.
	lå pts.	=	= 459	-63	=	=	2	- 624	=	-
	3501 Patrick & Co., Ltd., Halifax 12 pts. 25 Imperial Ext. Co., Toronto Mfrs		GISTAILY-HO Co., Ltd., Halifax	1 1	76605 Brown Bros. & Co., Halifax 113	606 Kinley's, Ltd., Halifax	607 W. A. Hart, Halifax	200X	5609 G. P. Blakley, Halifax 11	610 G. McCillvray, Halifax 1
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	40	=	3	=	=	2	E		=	=
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DISTRICT OF NEW BRUNSWICK-JOHN C. FERGUSON. INSPECTOR.

Orange.	Lemon. Pineapple.	Strawberry.	Lemon and Lime.	Raspberry. 4-1% Benz.	Pineapple.
35 J. H. Smith, Toronto	65 J. J. McLaughlin, Toronto. 55 Vendor. 45 Vendors	26 Vendor	75 Logan, Johnson Co., Boston,	50 Murray Co., Boston, Mass	0J. J. McLaughlin, Ltd,
S bote.	i i i	222	=	=	=
78041 William Hawkes & Son, St. 3 bots. 35 J. H. Smith, Toronto.	78042 H. J. Dick, Sk. John, N.B. 3 " 1.55 Vendor 78043 W. H. Bell, St. John, N.B. 3 " 1.55 Vendor 78044 Ross Drug Co., Ltd., Sk. John, 8 jara. 45 Vendors	78046] M. W. Paddock, St. John, N. B. 3 " 1 80 Vendor 78046; A. V. Checchi, St. Stephen, N. B. 3 " 75 " 75 " 75 " 76 " 76 " 77 " 77 " 77	78048 L. W. Vanvart, Fredericton, N. B. 3 " 75 Logan, Johnson Co., Boston,	78049 L. C. Heustis, Suesex, N.B 3	78050 (G. C. Lyall, N.B., Moncton 1 J. McLaughlin, Ltd.,
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June 26 Fruit Flavour		: * *		:	2
ruit I	:::	:::	2	=	2
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June	July	Aug.	8	*	2

BULLETIN No. 390-FRUIT FLAVOURS.

Inspector's Report. (Is	not an expression of opinion.)
of Manufacturer given by the or.	Furnisher.
Name and Address of Manufacturer or Furnisher as given by the Vendor.	Manufacturer.
Coet.	Centes.
	Quantity.
	Name and Address of Vendor.
.ө.	Yo. of Samp
	Nature of Sample.
.noite	Date of Collec

DISTRICT OF QUEBEC CITY-F. X. W. E. BELAND, INSPECTOR.

	e.	pple.	nade.	ı.	erry.	
Lemon.	Strawl Lemon Orang	Pineapple.	Lemonade.	Lemoi	Kaspberry Citronelle.	
	Rose & Laffainme.	Unknown	Mfr.	:	" Kaspberry.	
Co., Toronto.	, Toronto	Co., Toronto.	, Toronto	. Co., Toronto.	* #	
Imperial Ext.	A. B. Dupuis	Imperial Ext.	Laren's, Ltd.	Impenai Ext	2 2	
1.0	22.0	1-	3.07	9.1	0.1	
bots	:::	=	:: en en	=	20 00 E E	
71215 Peter Demetre, 74 St. Jean, 3 bots. 1.00 Imperial Ext. Co., Toronto	(2uebec. 3 " 1.00 " " Rose & Laffamme. Lemon. 1.100 " " Rose & Laffamme. Lemon. 1.1117, Jos. Bretton, 75 St. Paul, Quebec. 3 " 1.00 " " " " " " " Orange. " " Orange. " " Orange. " " " " " " " " " " " " " " " " " " "	Quebec. Cream, 3643 St. 3 70 Imperial Fxt. Co., Toronto Unknown	11220 Joseph, Quebec. 3 70 71220 X. Trivierge, 408 St. Valier, 3 3.00 Laren's, Ltd., Toronto	Quebec. 1222 Boston I.e Cream, 404 St. Joseph, 3 " 1.05 Imperial Fxt. Co., Toronto.	71223 ". ". ". 71224	
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1917.	888	8		8 8	88	
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DISTRICT OF QUEBEC PROVINCE-N. CADIEUX, TEMPORARY INSPECTOR.

.00 T. J. Couches & Co., Toronto .00 The Chattams' Candy Co., Toronto.	" 50 Vendor."
3 pts.	
5652 Constantin Janellas, St. Jerome. 3 pts. 1.00 T. J. Couches & Co., Toronto. 5653 J. A. Duelos, St. Jerôme. 3 ". 1.00 The Chattams' Candy Co., Toronto.	a Soda 5654 A. Desjardins, St. Jérôme 3 5655 S. Desorniesaux, St. Jérôme 3
June 26 Lemon Extract	26 Cream Soda 26
June	: :

INSPECTOR.
LAVALLEE
DR. V. P.
RIVERS-D
THREE
DISTRICT OF

" 26 Cream Soda ... Desjardins, St. Jérôme ... 3 " 50 Vendor ... 5655 S. Desormeaux, St. Jérôme ... 3 " 1.00 "

		,	
		Lyman, Ltd., Montreal.	
and the same of th	7450 Zaien & Legoie Co., Johette Lille, 3 00 King's Eat. (Co., 9458 St	". 12 02 02. 75 A. W. Grawford, Montreal 12 75 A. W. Grawford, Montreal 12 75 12 75 12 75 12 2.00 Wyeth Brus., Philadelphia Lyman, Ltd., Montreal.	
torquiring man days to the		7485 Adams, Three Rivers 7487 " 7487 " " 7487 " " 7488 " " " 7495 M. Stavros, Joliet*e	
	June 12 Pincapple Extract	12 Lemon Extract 20 Orangeade 20 Lemon 20 Cherry 20 Cherry 20 Pineapple. 27 Ext. Vanilla	

DISTRICT OF MONTREAL-J. J. COSTIGAN, INSPECTOR.

Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 " " Table 2. " " Table 3. " " Table 3. <	Lemon.	Vanilla	Strawberry Fruit.		Cherry Fruit.	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors. 15 White Flavour. 74082 74082 74083 74084 The Crettans' Co., Ltd., St. 3 in 3.75 1.50		:	:		:	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors. Ave., Montreal. 3 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50		:			:	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors. 1.50 Ave., Montreal. 3 1.50 1.50 1.50 1.50 1.50 1.50 1.50 1.50					:	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors. 74082 74082 74082 74082 74082 74084 The Crettans' Co., Ltd., St. 3 jars. 3.75 74084 The Tawrence Boul 3 3 3.80	:				:	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors. 1.50 Fruit Flavour. 74082 " 3 " 1.50	<u>:</u> ::	:	:	<u>. </u>	:	-
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors. 15 White Flavour. 74082 74082 74083 74084 The Crettans' Co., Ltd., St. 3 iars. 3.75 1.50 1.5					:	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Vendors 1.55 " 1.50 Vendors 1.55 " 1.50		:	:			
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots, 1.50 Vendors 1.55 m. 1.50 m. 1.5		:	:	:	:	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1.50 Ver. 15 " 3 " 3 " 3 " 3 " 3 " 3 " 3 " 3 " 3 "	ndors	I	r :	=	Ξ	
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 bots. 1. 15 " " 74083 " 74083 " 74083 " 74083 " 15 " " 74083 " 74083 " 74083 " 17 " 7 " 74083 " 74084 The Crettans' Co., Ltd., St. 3 jars. 3 " 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	.00 Ve	8 8	2 10	2	8	-
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colonial 3 b Ave., Montreal 3 74083 774083 7 74084 The Crettans' Co., Ltd., St. 3 is 3 74084 The Crettans' Co., Ltd., St. 3 is 3	 	= =			E	-
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 Colon 74082 " Ave., Montreal. " 74083 " 74083 " 74084 The Crettans' Co., Ltd., 174084 The Crettans' Co.,	is] 3 b	n :	2 2	0 3C	60	-
Aug. 15 Fruit Flavour. 74081 New York Syrup Co., 352 74082 7 74082 7 74084 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	Colon	8	27		=	
Aug. 15 Fruit Flavour. 74081 New York Syrup C. 74082 " 74082 " 74083 " 74083 " 74084 " 74084 " 74084 The Crettans' C. 74084 The Crettans' C. 74084 The Crettans' C. 74084 The Crettans' C. 74086 The Cretans' C. 74086 Th	5., 352		-	7.		
Aug. 15 Fruit Flavour. 74081 New York Sy Ave., Mont 15 " " 74082 " 74082 " 74083 " 74083 " 74084 The Crettan 1 7 " " 74084 The Crettan 1 7 " " " 74084 The Crettan 1 7 " " " 74084 The Crettan 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	rup C.		5	کر چ	Jones.	
Aug. 15 Fruit Flavour. 74081 New Y. 115 " " 74082 " 74082 " 74083 " 74083 " " 74084 The C	ork Sy Mont			rectan		
Aug. 15 Fruit Flavour. 74081 N 115 m 74082 m 74083 m 74083 m 74083 m 74083 m 74083 m 74084 T 74084 T 74084 T 74084 T 74084 T 74084 T 7 m 7 m 74085	Ave.	8	2 (2	LABWI	
Aug. 15 Fruit Flavour.	1901	1082	4083	100	408	-
Aug. 15 Fruit Flavour	:	-		:	-	
Aug. 15 Fruit Flavour 11 15 " " 1 15 " " 1 17 " "			:	:		
Aug. 15 Fruit F 15 7 7	avour	2	2	2	*	
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	Aug.	2	=	2	3	:

DISTRICT OF OTTAWA-J. A. RICKEY, INSPECTOR.

Pineapple.	1% Benz. of Fuda.			0/2	Soda Benz. and Colour. Strawberry. Contains Craur and % of 1% Sod. Benz.	Raspberry. Creme de Menthe Cherries. Contains not more than 4 of 1% Ben.	Sod, and Colour.
				W. P. Downey, Montreal			
77512 B. Hutchingame, 793 Bank St., 3 bots, 1.20 J. J. McLaughlin, Ltd.,	=	77514 S. Adams, 97 Bank St., Ottawa 12 ozs. 75 E. O Preston & Co., Toronto 77515 Russell Candy Store, 40 Sparks 3 bots 1.00 K. B. Hayhoe & Co., Toronto	3 " 50 E. W. Jeffries, Walkerville,	l Ext. Co., Toronto	24 ozs. 1.35 J. A. Smith & Co., Ltd.,	77535 ". 1.35 ". McLaughlin, L'd., Ottawa 1 jar. 1.50 J. J. McLaughlin, L'd., Toronto.	
93 Bank St., 3 bots. 1.2	77513 G. Pouloe, Somerset and Bank 1 Sea- 1.25	St., Ottawa 12 ozs. 7 re, 40 Sparks 3 bots. 1.0	2 m	:	:	d., Ottawa 1 jar. 1.5	
512 B. Hutchingame, 7	513 G. Poulos, Somers	514 S. Adams, 97 Bank 515 Russell Candy Stol	77516 st., Ottawa.	77517 "	77534 W. C. Burns, Cornwall	535 [572]J. L. Rochester, Lt.	
	77		22	22	=======================================	77536	
June 19 Fruit Flavours	=	::	:	::	I.	::	
June 19	19	91.08		88	2	" 30	

BULLETIN No. 390-FRUIT FLAVOURS.

Inspector's Report. (Is	not an expression of opinion.
of Manufacturer given by the dor.	Furnisher.
Name and Address of or Furnisher as g	Manufacturer.
Cost.	Quantity.
Name and Address of	Vendor.
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	ure of Sample.
noiteetion.	Date of C

DISTRICT OF KINGSTON-JAMES HOGAN, INSPECTOR.

30 Vendor. 30 J. H. Smith, Toronto. 30 Vendor. 30 Vendor. 30 Vendor. 30 J. H. Smith, Toronto.
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72591 W. E. Austin, Kingston 72593 T. Sakell, Kingston. 72595 " " " " " " " 72595 T. 22595 T. 72599 B. Zbar, Kingston. 72599 B. Zbar, Kingston.
Strawberry 72591

DISTRICT OF TORONTO-H. J. DAGER, INSPECTOR.

Shirriffe, Contains Sod.	Pineapple, Crushed Fruit.	Strawberry.	Cherry.	Orange.	Contain Colombia	of 1% Benz. Soda.	Figs. Contain 14 of 1% Sod. Benz.
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Imperial Ext. Co., 10 Matilda 3 jars. 1.25 Vendors St., Toronto.	:	r	=	*	=	=	:
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jarr.	The T. A. Lytle Co., Lu., Ster- 3 pts. 1.05 ling Rd., Toronto.	8 3 bots. 90	Jar's	3 bots.	McMahon, 173 Sheridan 3 " Toronto.	J. Hungerford Smith Co., Ltd., 3	
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77864	778% Th	7786	2	77868	1 108//	77869 J.	77870
77864	77845 Th	7786	2	77868	1 108//	77869 J.	77870
77864	77845 Th	77866	1/00/1	77868	1 109//	77869 J.	07877
77864	" 77845 Th	7786	2	17868	1 108//		77870
77864	" " 77845 Th	7786	2	89822	1 108//	17869 J.	77870
June 14 Fruit Flavour 77864 In	14 " " 77845 Th	7786	2	15 " 17868	1 108//	16 " " 77869 J.	77870

Peaches. Contains not more than 15 of 1%	Claret. Contains Colour and not more than 15 of 1% Sod. Benz.
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Pineapple, Contains to 17, Sod. Bens. Figs. Contains to 18, Sod. Bens. Figs. Contains to of 18, Sod. Bens.

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" 16 " " 77869 J. Hungerford Snith Co., Ltd., 3 " " 16 " " 77870 " 77870 " 3 " " 3 " "

DISTRICT OF HAMILTON-H. J. DAGER, ACTING INSPECTOR.

Pinespple.	Cherries.	Strawberry.	2	Pineapple.	Grape-Vine.	Raspherry.	Strawberry.		2
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A 04	.50 U	8	8	<u> </u>	40 E	25.0	9	72	90.
77963 Grant & Co., 107 Wyndham St., 3 bots. 40 Vendors	77964 Yeates & Thomas, 27 Wyndham 3 pts. 2.50 Unknown	77965 A. H. Frenain, 50 Market St., 3 " 1.50 Vendor	77966 J. W. Thomas, 111 Colborne St., 3 bots. 90 J. H. Smith Co., Toronto	pts.	ote.	77369 C. E. Walker, 209 King St., E., 3 bots. 25 Vendor		Pie	=
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W 201	188, 2	. 38	=	andy	165.0	200	30 Ki	84 Ja	Ltal.,
70., 1	Thou	ingin.	inas,	bia C	od,	lker,	in,	Bem,	er's,]
Grant & C	res de la	A. H. Fremain	W. Thom	Colum	H	St. Catnarines.	H. Chilman,	Aus	Christopher's, E., Hamilt
Gra	N S	A. I	7	The	30.0	1 C	H	J. A	Chris E
77.96	7196	77968	77966	77.967	77968 G. G. Hood, 165 St. Paul St., 3 bota. 40 E. W. Jeffries, Ltd., Walk-	77968	77970 H. Chilman, 50 King St., W., 3	77971 J. A. Aussem, 84 James St., N., 3 pts. 75	77972 Christophers, Ltd., S. King St., 3 1.06 Vendors E., Hamilton.
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DISTRICT OF WINDSOR-JOHN TALBOT, INSPECTOR.

Sweetheart Brand.							Strawberry.	Fineappie.	The state of the s
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Spice	td.,						hlim's,		
X. L.	wes. I	ndor.	endors		To Vendor.	= 1	ola Claughlin's, Toronto	=	
715 L.	50 Bo	90 Ve	15 Ve	8	75 Ve	18	DO ME	23	
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noury, St. Thomas 3 jars	tie, St. Thomas 3 "	it, Londen 3 "	andy Co., London 3	on Lo	ner, London 3 "	as, London 3 " 1	trathroy	s, Strathroy 3 "	
& Knoury, St. Thomas 3 jars	Beattie, St. Thomas 3 "	. Kent, Londen 3 "	Candy Co., 1	on Lo	Boomer, London 3 "	Chivas, London 3 " 1	nn, Strathroy 3 "	Voods, Strathroy 3 "	
Abdo & Knoury, St. Thomas 3 jars	R. H. Beattie, St. Thomas 3 "	G. W. Kent, London 3 "	Olympia Candy Co., London 3 "	on Lo	H. E. Boomer, London 3 "	J. M. Chivas, London 3 " 1	J. Nunn, Strathroy(3 "	Jas. Woods, Strathroy 3 "	
65259 Abdo & Knoury, St. Thomas 3 jars	5260 R. H. Beattie, St. Thomas 3 "	65261 G. W. Kent, London	Candy Co., 1	on Lo	65264 H. E. Boomer, London 3 "	65265 J. M. Chivas, London 3 " 1	65269 J. Nunn, Strathroy [3 "	65270 Jas. Woods, Strathroy 3 "	
65259 Abdo & Knoury, St. Thomas 3 jars. 75 L.X. L. Spice and Coffee Co.,	65260 R. H. Beattie, St. Thomas 3 "	65261 G. W. Kent, Londen 3 "	Candy Co., 1	on Lo	65264 H. E. Boomer, London 3 "	65265 J. M. Chivas, London 3 " 1	65269 J. Nunn, Strathroy(3 "	65270 Jas. Woods, Strathroy 3 "	
65259 Abdo & Knoury, St. Thomas 3 jars	65260 R. H. Beattie, St. Thomas 3 "	65261 G. W. Kent, Londen 3 "	Candy Co., 1	on Lo	65264 H. E. Boomer, London 3 "	65265 J. M. Chivas, London 3 " 1	65269 J. Nunn, Strathroy(3 "	65270 Jas. Woods, Strathroy 3 "	
lavour 65259 Abdo & Knoury, St. Thomas 3 jars	" (65260 R. H. Beattie, St. Thomas 3 "	" 65261 G. W. Kent, Londen	Candy Co., 1	on Lo	" 65264 H. E. Boomer, London 3 "	" 65265 J. M. Chivas, London 3 " 1	" 65269J. Nunn, Strathroy(3 "	" 65270 Jas. Woods, Strathroy 3 "	
ruit Flavour 65259 Abdo & Knoury, St. Thomas 3 jars			Candy Co., 1	" 65263 J. Fawkes & Son, Lo	652	" " Chivas, London 8 " 1	65269	65270	
19 Fruit Flavour 65239 Abdo & Knoury, St. Thomas 3 jars			" " 65262 Olympia Candy Co., 1	" " 65263 J. Fawkes & Son, Lo	6528		., ., 65269	" " 65270	

Lemon. Made from ex-

DISTRICT OF ALBERTA-A. W. R. MARKLEY, INSPECTOR.

June 22 Fruit Flavours...... 52693 The Owl Drug Co., Edmonton... 3 pts. 75 Vendors......

BULLETIN No. 390.—FRUIT FLAVOURS.

Inspector's Report. (Is	not an expression of opinion.)				Fineapple. Orange. Cherry. Strawberry. Raspberry. Loganberry. Vanilla. Orangeade. Wild Cherry. Chocolate
Manufacturer iven by the	Furnisher.	PECTOR.			
Name and Address of Manufacturer or Furnisher as given by the Vendor.	Manufacturer.	HOS. ARMSTRONG, INS	3 pts. 1.05 J. J. McLaughlin, Toronto	DISTRICT OF MANITOBA-J. B. COSGROVE, INSPECTOR.	90 MacNab& Roberts, Winnipeg 1.15 "
Cost.	Quantity.	TARIO-T	3 pts. 1.05.J	OBA-J. B.	
	Name and Address of Vendor.	DISTRICT OF NORTHERN ONTARIO-THOS. ARMSTRONG, INSPECTOR.	73612 W. R. Loury, Cotalt	DISTRICT OF MANIT	75325 Arlington Lauch, 885 Portage 3 pts. Ave., Winniper, 387 Portage 3 Ave. Winniper, 386 Portage 3 75326 Ave. Winniper, 386 Portage 3 75328 R. G. Gordon, 250 Portage Ave., 3 75331 F. A. Kent, Killarney 75331 A. H. Arkinson, Deloraine 75533 A. H. Arkinson, Deloraine 75506 W. H. Wiggins, Holland 75507 W. H. Wiggins, Holland 75508 W. H. Wiggins, Holland
	Nature of Sample.		4 Fruit Flavour 73		June 21 Fruit Flavour. 75 22 75 23 75 July 3 75 10 75 110 75
lection.	Date of Col		1917. July 4		June 21 22 22 23 10 10 10 10 10 10 10 10 10 10 10 10 10

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Lemon. Made from ex- tract.	
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Owl Drug Co., Edmonton 3 pts. 75 Vendors	
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DISTRICT OF ALBERTA-A. V. R. MAKALEY, INSPECTOR.

Orange. Made from con-	Strawberry. Made from concentrated.		Vanilla. Made from con- centrated.		v. Veretable	colour added.	F. Sameta Managament	added.
Orange. May centrated.	Strawberry. M	Pineapple.	Vanilla. M centrated.	Orange.	3	colour a	Raspherr	added.
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DISTRICT OF ROCKY MOUNTAINS-THOS. PARKER, INSPECTOR.

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DISTRICT OF VANCOUVER.-G. G. ARMYTAGE, INSPECTOR.

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BULLETIN No. 390-FRUIT FLAVOURS.

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DISTRICT OF VICTORIA-G. G. ARMYTAGE, ACTING INSPECTOR.

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